Appendix A : 37 C.F.R. 1.132 Declaration titled "Variable half-life of metastable Indium 115m after photoactivation using a Cobalt-60 source".

The following appendix is a declaration section 37 C.F.R. 1.132

I, Robert DESBRANDES, declare that I am warned that willful false statements and the likes are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon.

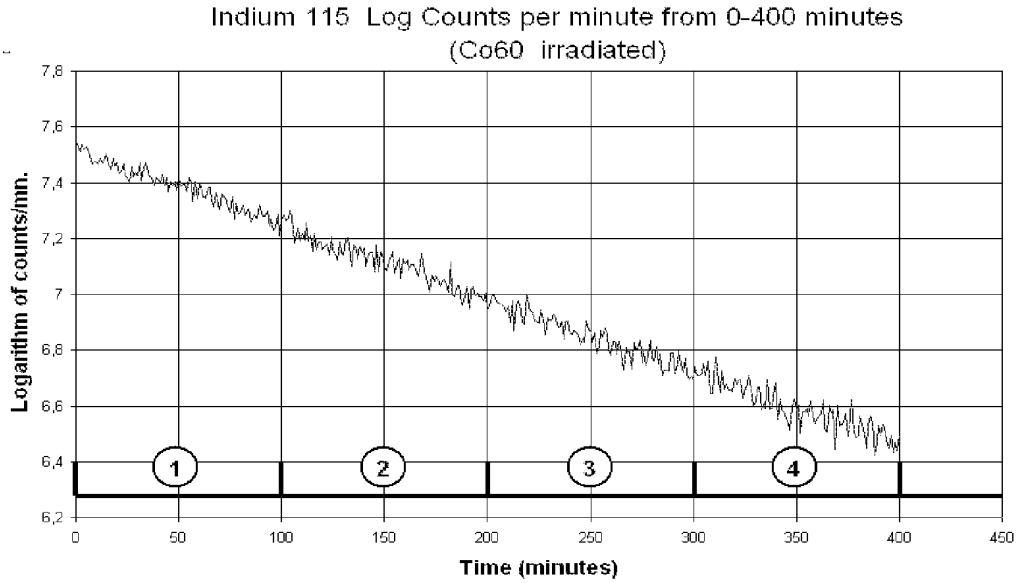
I declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true.

Robert DESBRANDES
S-Signed: /Robert DESBRANDES/
Original submitted with my USPTO efiling electronic signature.

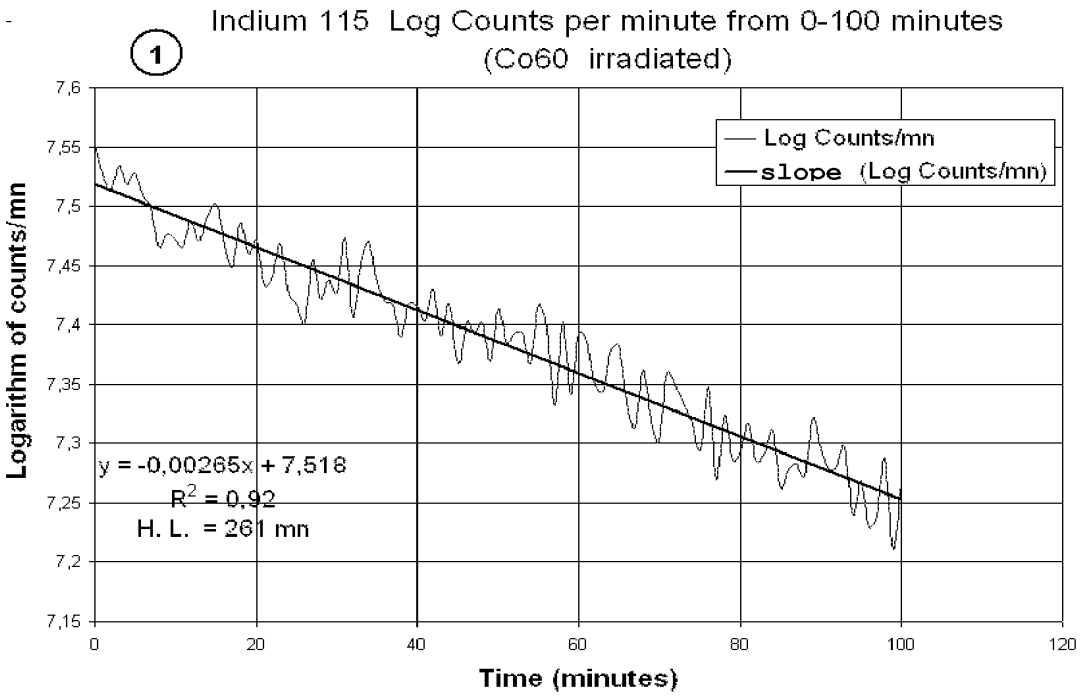
The measurements were carried out in Louisiana State University, Baton Rouge, Louisiana on October 7th, 2003:

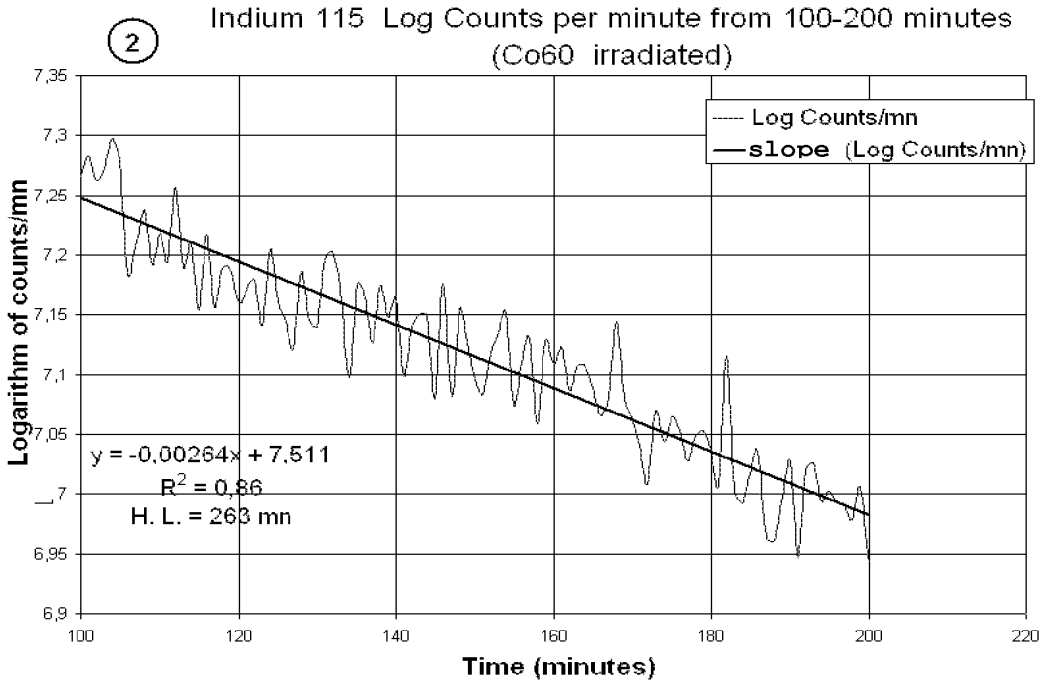
- The irradiation of the Indium foil with the Cobalt-60 source was operated by Professor Daniel Lee Van Gent.
- I, and Professor Daniel Lee VAN GENT, have been operating the gamma spectrometer which was a Canberra high purity intrinsic Germanium gamma counting system enclosed in an Orthec low level background shield made of lead, copper and steel;
- I interpreted the data reported in the following pages.

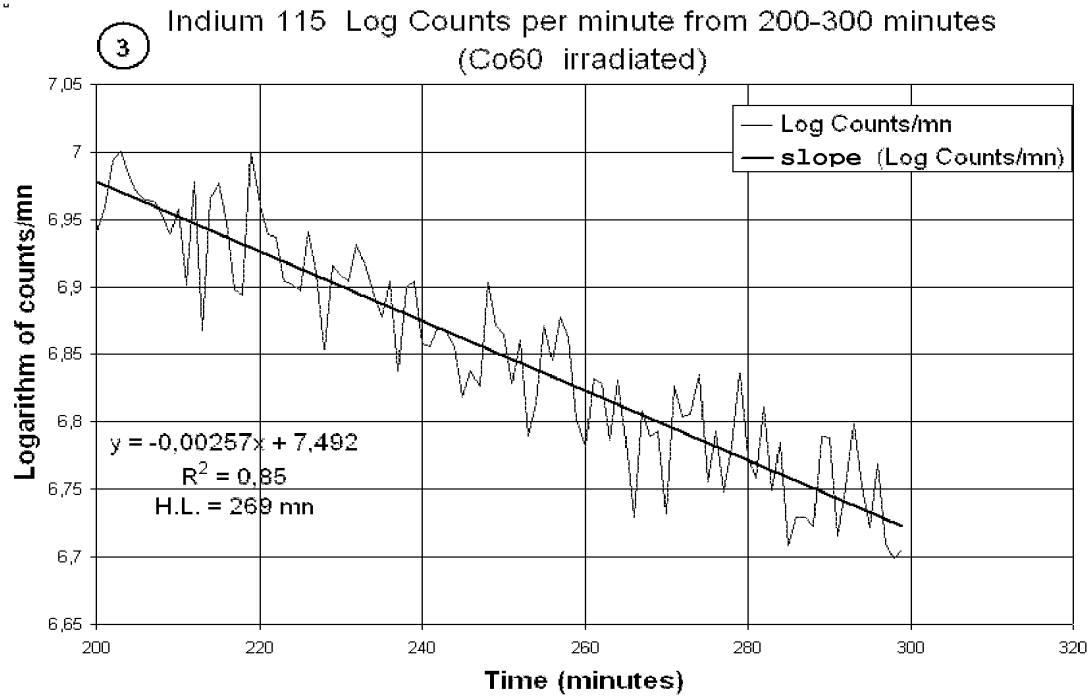
The Indium 115 samples used in the experiments were:
25 mm wide, 75 mm long, 0.3 mm thick.
The abundance of In 115 was 95.72%, purity 99.99%.
The irradiator was a HICS Shepherd upright irradiator with two 1500 Ci sources (at the time). The samples were taped about 25 mm away from the sources.
The time of irradiation was 12 hours for 95% saturation.
The following graph is the recording of the counts per minute emitted at 336 keV by the excited isomer nuclide: Indium 115^{m}.

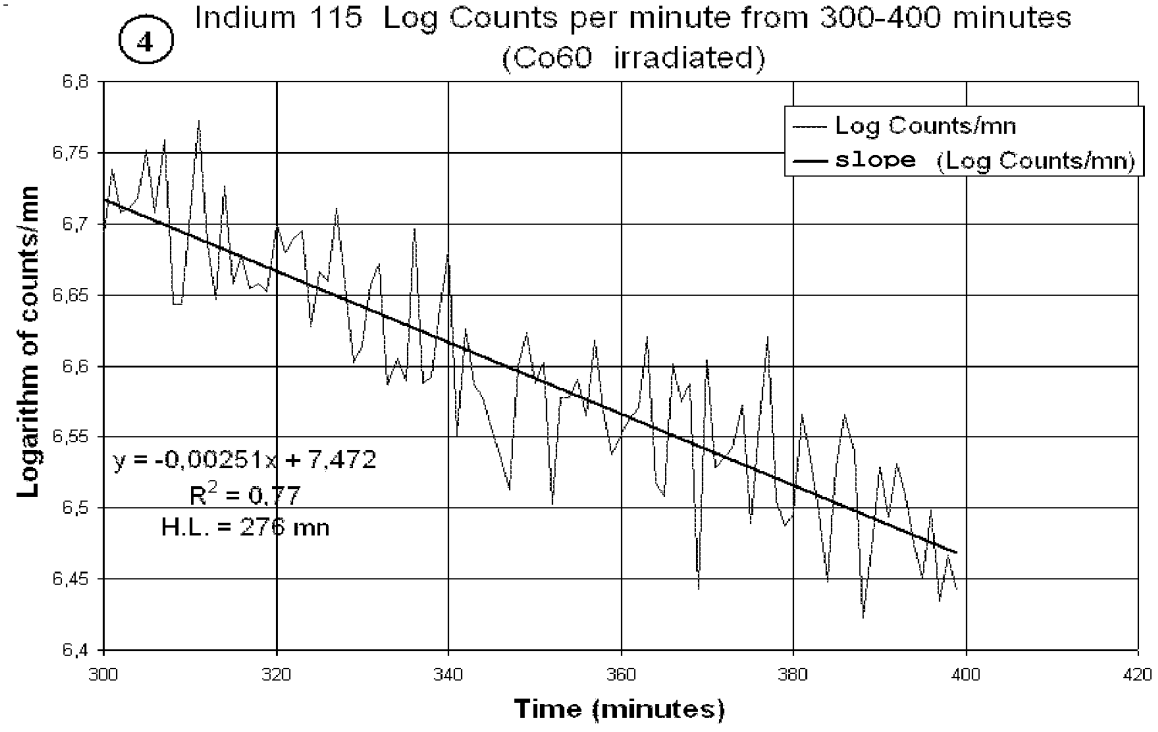


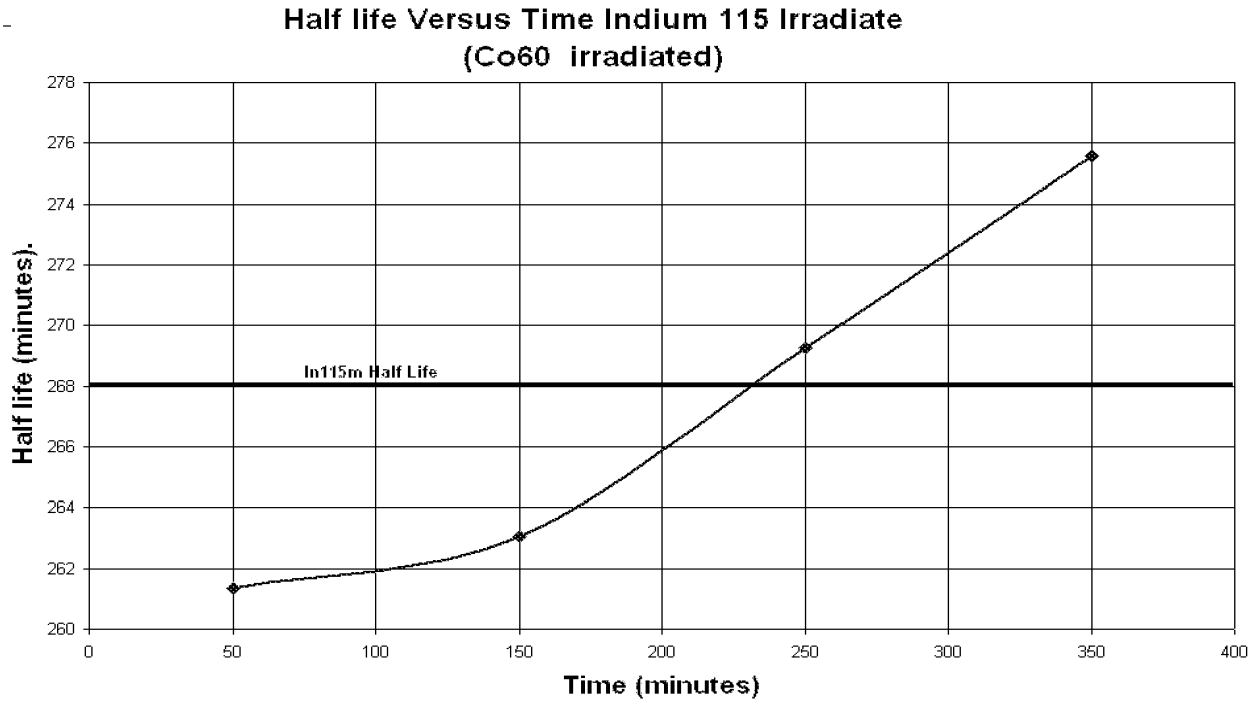
The variable half-life is computed over intervals of 100 minutes:
The following graphs display the logarithm of the deexcitation gamma rays counts per minutes of the "entangled sample" product. A linear regression equation is used to compute the slope and the regression coefficient (R^2). The variable half-life (H.L.) is noted λ and the slope is noted P (probability of deexcitation per minute) in the equation of paragraph [0002] which are all well known to the one skilled in the art.


Indium 115 Log Counts per minute from 0-100 minutes
(Co60 irradiated)
1
Log Counts/mn
slope (Log Counts/mn)
y = -0,00265x + 7,518
R2 = 0,92
H. L. = 261 mn
Logarithm of counts/mn
Time (minutes)
7,6
7,55
7,5
7,45
7,4
7,35
7,3
7,25
7,2
7,15
0
20
40
60
80
100
120


Indium 115 Log Counts per minute from 100-200 minutes
(Co60 irradiated)
2
Log Counts/mn
slope (Log Counts/mn)
y = -0,00264x + 7,511
R2 = 0,86
H. L. = 263 mn
Logarithm of counts/mn
Time (minutes)
7,35
7,3
7,25
7,2
7,15
7,1
7,05
7
6,95
6,9
100
120
140
160
180
200
220


3
Indium 115 Log Counts per minute from 200-300 minutes
(Co60 irradiated)
Log Counts/mn
slope (Log Counts/mn)
y = -0,00257x + 7,492
R2 = 0,85
H.L. = 269 mn
Logarithm of counts/mn
Time (minutes)
7,05
7
6,95
6,9
6,85
6,8
6,75
6,7
6,65
200
220
240
260
280
300
320


4
Indium 115 Log Counts per minute from 300-400 minutes
(Co60 irradiated)
Log Counts/mn
slope (Log Counts/mn)
y = -0,00251x + 7,472
R2 = 0,77
H.L. = 276 mn
Logarithm of counts/mn
Time (minutes)
6,8
6,75
6,7
6,65
6,6
6,55
6,5
6,45
6,4
300
320
340
360
380
400
420


Half life Versus Time Indium 115 Irradiate
(Co60 irradiated)
Half life (minutes).
278
276
274
272
270
268
266
264
262
260
In115m Half Life
0
50
100
150
200
250
300
350
400
Time (minutes)

Measurement data:

min	Counts	LN Counts
0	1902	7,550713818
1	1859	7,527761712
2	1832	7,512928802
3	1872	7,53453293
4	1842	7,518661504
5	1859	7,527761712
6	1825	7,509477722
7	1804	7,497878102
8	1748	7,466467802
9	1765	7,476053267
10	1759	7,472466634
11	1747	7,465861356
12	1785	7,487319342
13	1756	7,470668482
14	1792	7,490847609
15	1811	7,501369376
16	1752	7,468267808
17	1718	7,448852073
18	1782	7,485547723
19	1737	7,459822649
20	1756	7,470668482
21	1692	7,433412371
22	1705	7,441472871
23	1752	7,468267808
24	1680	7,426549072
25	1664	7,417105815
26	1638	7,401164107
27	1728	7,454962975
28	1673	7,422152517
29	1698	7,437141583
30	1680	7,426549072
31	1760	7,473069088
32	1646	7,406291699
33	1720	7,45007957
34	1756	7,470668482
35	1696	7,435898091
36	1669	7,42026149
37	1663	7,416468674
38	1619	7,389526893
39	1665	7,417736546
40	1661	7,415205212
41	1642	7,403731189
42	1686	7,430297989
43	1621	7,390829366
44	1665	7,417736546
45	1583	7,367171812

46	1640	7,402451521
47	1623	7,392123985
48	1638	7,401164107
49	1587	7,369827538
50	1659	7,413934123
51	1612	7,384964138
52	1625	7,393423082
53	1625	7,393423082
54	1583	7,367171812
55	1664	7,417105815
56	1631	7,396654261
57	1529	7,332676549
58	1639	7,40180497
59	1543	7,341581061
60	1624	7,392776823
61	1613	7,385621666
62	1556	7,349732307
63	1546	7,343626727
64	1601	7,378414943
65	1608	7,38300761
66	1536	7,336793674
67	1501	7,313920142
68	1575	7,361839108
69	1512	7,320904125
70	1482	7,30121528
71	1572	7,359830399
72	1557	7,350413405
73	1532	7,334048632
74	1509	7,319513875
75	1472	7,294085137
76	1553	7,347705546
77	1436	7,269463535
78	1517	7,324384502
79	1460	7,286191715
80	1472	7,294085137
81	1505	7,31672092
82	1458	7,284745464
83	1468	7,291942272
84	1497	7,311111498
85	1425	7,262109532
86	1447	7,277496486
87	1455	7,282575595
88	1440	7,272398393
89	1513	7,321605137
90	1475	7,296230201
91	1448	7,278228586
92	1452	7,280401008
93	1476	7,296941943
94	1394	7,23970301

95	1435	7,268731957
96	1379	7,229070367
97	1393	7,238949325
98	1462	7,287629037
99	1354	7,210582089
100	1431	7,265793294
101	1455	7,282575595
102	1426	7,262845969
103	1440	7,272398393
104	1476	7,296941943
105	1448	7,278228586
106	1320	7,185387016
107	1354	7,210582089
108	1391	7,237433057
109	1328	7,191745545
110	1364	7,218330785
111	1333	7,194909712
112	1418	7,25692513
113	1326	7,190155929
114	1353	7,209806124
115	1280	7,154615357
116	1363	7,217553477
117	1282	7,156254638
118	1325	7,189363946
119	1324	7,188571334
120	1287	7,160348889
121	1301	7,17092691
122	1312	7,178980172
123	1263	7,14136388
124	1346	7,205122796
125	1289	7,16198656
126	1267	7,144691276
127	1238	7,121163596
128	1321	7,186182154
129	1269	7,14635477
130	1262	7,140532279
131	1335	7,196484303
132	1343	7,202772881
133	1303	7,172539689
134	1209	7,097937526
135	1308	7,176575581
136	1294	7,165246149
137	1244	7,126256069
138	1305	7,174157534
139	1273	7,148840904
140	1291	7,162800517
141	1211	7,098805298
142	1261	7,139699986
143	1275	7,15048967

144	1275	7,15048967
145	1187	7,079487634
146	1308	7,176575581
147	1191	7,082145465
148	1280	7,154615357
149	1247	7,128784597
150	1208	7,097069
151	1193	7,083916231
152	1233	7,116905377
153	1256	7,135512172
154	1277	7,152143555
155	1182	7,075047797
156	1224	7,110051017
157	1249	7,13047474
158	1163	7,058887121
159	1246	7,127942465
160	1223	7,109184777
161	1240	7,122866659
162	1196	7,086553971
163	1221	7,107466423
164	1220	7,106606138
165	1198	7,088316955
166	1172	7,066100009
167	1189	7,081263109
168	1267	7,144691276
169	1189	7,081263109
170	1169	7,064305934
171	1143	7,041542889
172	1105	7,00783588
173	1175	7,068793613
174	1146	7,044303367
175	1171	7,065203374
176	1156	7,05253072
177	1128	7,028573703
178	1151	7,047969293
179	1157	7,053447429
180	1138	7,036930949
181	1105	7,00783588
182	1231	7,115192123
183	1100	7,003065459
184	1088	6,992482382
185	1116	7,017308991
186	1137	7,036007763
187	1058	6,964031637
188	1056	6,962035109
189	1094	6,997303436
190	1127	7,027633895
191	1040	6,946975992
192	1119	7,020137088

193	1125	7,025769399
194	1091	6,994409926
195	1099	7,002101358
196	1089	6,993446618
197	1086	6,990541911
198	1074	6,978847279
199	1102	7,00497273
200	1034	6,940880529
201	1053	6,959047073
202	1089	6,993446618
203	1098	7,001145435
204	1079	6,983734357
205	1064	6,969988019
206	1058	6,964031637
207	1057	6,963038603
208	1046	6,953024968
209	1032	6,938837193
210	1052	6,958039564
211	994	6,901415223
212	1073	6,977868856
213	961	6,868026437
214	1059	6,965023687
215	1072	6,976880142
216	1041	6,947985098
217	991	6,898230058
218	986	6,893970707
219	1097	7,000188597
220	1055	6,961040089
221	1032	6,938837193
222	1029	6,936799386
223	997	6,904590276
224	994	6,901415223
225	989	6,897169446
226	1034	6,940880529
227	1003	6,910900328
228	947	6,853679169
229	1008	6,916140029
230	1001	6,908804728
231	997	6,904590276
232	1024	6,931676863
233	1009	6,91718072
234	986	6,893970707
235	971	6,87783201
236	997	6,904590276
237	933	6,838008552
238	992	6,899289546
239	997	6,904590276
240	952	6,858113252
241	949	6,855903934

242	963	6,870209163
243	959	6,865828508
244	949	6,855903934
245	915	6,81862894
246	933	6,838008552
247	922	6,826653678
248	996	6,90352635
249	964	6,871309113
250	958	6,864732949
251	924	6,828939319
252	954	6,860328185
253	888	6,789444604
254	911	6,814015865
255	964	6,871309113
256	940	6,845879875
257	971	6,87783201
258	956	6,862527761
259	900	6,802394763
260	882	6,782305428
261	927	6,83234184
262	924	6,828939319
263	886	6,787066777
264	926	6,831208952
265	885	6,785881387
266	837	6,729632893
267	905	6,808222195
268	888	6,789444604
269	892	6,792983954
270	839	6,73213919
271	922	6,826653678
272	901	6,80356075
273	903	6,805888653
274	929	6,834614531
275	859	6,755699071
276	892	6,792983954
277	853	6,74832569
278	882	6,782305428
279	931	6,83574357
280	875	6,773915267
281	861	6,758152575
282	908	6,811706827
283	854	6,749556416
284	884	6,784694591
285	819	6,708010821
286	837	6,729632893
287	837	6,729632893
288	832	6,72331548
289	888	6,789444604
290	887	6,788250762

291	825	6,715698488
292	855	6,75078563
293	897	6,798877474
294	856	6,752013334
295	831	6,722052011
296	871	6,769090734
297	820	6,70930434
298	812	6,698970643
299	817	6,705443237
300	806	6,692468284
301	844	6,738401279
302	819	6,708010821
303	821	6,710584009
304	827	6,718239909
305	856	6,752013334
306	819	6,708010821
307	862	6,759371273
308	767	6,642956052
309	767	6,642956052
310	819	6,708010821
311	874	6,772714176
312	801	6,685923367
313	771	6,647065612
314	834	6,725849636
315	779	6,657934021
316	794	6,676680357
317	776	6,653868975
318	779	6,657934021
319	775	6,652514582
320	812	6,698970643
321	796	6,679322766
322	804	6,689860429
323	808	6,695081725
324	756	6,627750329
325	785	6,666014873
326	780	6,65929392
327	821	6,710584009
328	779	6,657934021
329	737	6,602370772
330	745	6,613733151
331	778	6,656585126
332	789	6,671361834
333	725	6,586530211
334	739	6,605216727
335	727	6,589421541
336	809	6,696379713
337	726	6,587976921
338	729	6,592318243
339	766	6,641586788

340	798	6,681970743
341	700	6,551080335
342	755	6,626360069
343	725	6,586530211
344	719	6,577777905
345	704	6,557076607
346	691	6,537444937
347	674	6,512755221
348	735	6,599503085
349	753	6,623573739
350	726	6,587976921
351	737	6,602370772
352	667	6,50332963
353	719	6,577777905
354	719	6,577777905
355	728	6,590877805
356	709	6,564518212
357	748	6,617964318
358	713	6,568962352
359	691	6,537444937
360	701	6,552579211
361	708	6,563037138
362	714	6,570434683
363	751	6,6207663
364	677	6,517434908
365	671	6,508053531
366	736	6,600931161
367	717	6,574852664
368	726	6,587976921
369	628	6,443208733
370	738	6,603794762
371	684	6,528264888
372	688	6,534399117
373	694	6,542010759
374	715	6,571904849
375	658	6,489037744
376	706	6,560054235
377	751	6,6207663
378	668	6,504916718
379	657	6,487440458
380	662	6,495416602
381	711	6,565997096
382	688	6,534399117
383	663	6,497001209
384	632	6,448208783
385	684	6,528264888
386	711	6,565997096
387	693	6,540495946
388	616	6,422889757

389	646	6,471279265
390	684	6,528264888
391	661	6,49382948
392	686	6,531329421
393	671	6,508053531
394	648	6,474538635
395	633	6,449885733
396	664	6,498598365
397	623	6,43478726
398	643	6,466377979
399	627	6,441520539
400	661	6,49382948